CURRENT LITERATURE
IN
AGRICULTURAL ENGINEERING

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ENGINEERING

Vol. 6, No. 9. WASHINGTON, D. C. April, 1937.

Accidents.

Farming - a hazardous occupation. By C. M. Seagraves. Nation's Agriculture. v. 12, no. 5. March, 1937. p. 8, 10.

Prevention of silo gas accidents. By D. J. Price, H. E. Roethe and M.A. Bradshaw. Agricultural Engineering. v. 18, no. 3. March, 1937. p. 104, 106. How to prevent silo gas accidents. 1. Because of presence of suffocating gas, care should be exercised on entering silo during storage of fresh material for ensiling. 2. Greatest danger comes when large quantities of carbon dioxide gas are generated during fermentation that always takes place. 3. Increase in carbon dioxide, together with actual lowering of oxygen content of air, often results in mixture of gases that will not support life, and persons entering silo are in danger of suffocation. 4. Pit silo, with its lack of ventilation, is source of greatest danger from gas suffocation. 5. Air in above-ground silos may be regulated by keeping one of many doors open near surface of silage. 6. Presence of dangerous gases may be detected easily by lowering small animal or fowl, or a miner's safety lamp, if available, into silo before anyone enters. 7. No attempt should be made to enter silo until gases have been removed by agitating the air. 8. No one should enter silo while fermentation is in progress, unless others are present to render necessary air in case of an accident. 9. When it is necessary to rescue a person overcome by gas in silo, a rope should be tied securely to person entering so that he can be removed promptly. 10. In cases of suffocation from silo gases, person affected should be removed as quickly as possible, and artificial respiration given immediately, if he has stopped breathing.

Agriculture.

Credit for agriculture in 1936. Washington, D.C., Farm Credit Administration, 1937. 26p.

Engineering studies of farms for maximum efficiency. By N.A. Kessler. Agricultural Engineering. v. 18, no. 3. March, 1937. p. 116, 121. Gives tabulation of subjects indicating various studies which may be made either individually, or in relation to others, or to project as a whole.

Influence of English agriculture on American agriculture, 1775-1825. By Rodney C. Loehr. Agricultural History. v. 11, no. 1. January, 1937. p. 3-15.

Air Conditioning.

Air conditioning for egg production. Prairie Farmer. v. 108, no. 19. September 12, 1936. p. 20-21.

Air Conditioning. (Cont'd)

Design and operating problems in air conditioning. By Samuel R. Lewis. Ice and Refrigeration. v. 92, no. 4. April, 1937. p. 293-296. Discussion of problems in connection with operation of complete air conditioning systems.

Estimating humidification requirements of residences. By William H. Severns. Air Conditioning and Refrigeration News. v. 19, no. 16. December 16, 1938. p. 18-19.

Handling the summer load. By V. L. Sherman. American Builder and Building Age. v. 59, no. 3. March, 1937. p. 100, 102, 104. Paper from Research Department of University of Illinois.

Low-cost air-conditioned house. By E.L. Sylvester. Edison Electric Institute Bulletin. v. 5, no. 3. March, 1937. p. 71-73, 93.

Reference list of important publications dealing with heating and air conditioning. Heating and Ventilating. v. 34, no. 2. February, 1937. p. 42-44.

Window with double glass aids air conditioning. Popular Mechanics. v. 66, no. 5. November, 1936. p. 680. Designed for use in homes equipped with air-conditioning apparatus. Double-glass window with three-fourths inch dead air space is now on market. Heat losses through windows are said to be reduced more than fifty per cent and condensation and frosting are eliminated, under normal conditions.

Alcohol Fuel.

Alcohol from crops of tropics may be fuel of the future. Popular Mechanics. v. 66, no. 6. December, 1936. p. 808. Dr. Edison Pettit of Mt. Wilson observatory estimates that it would take a half million square miles, barely entire annual grain crop of this country, to supply alcohol to replace gasoline now being consumed. He suggested that fertile tropical lands may become increasingly important in world's future development as producers of sugar-bearing plants. World should use coal and save its oil, for fuel problem must be solved within fifty years.

Blasting.

Blasting with safety. W. A. Rowlands. Madison, Wis., 1937. 24p. Wisconsin. College of agriculture. Extension service. Circular no. 288.

Building Materials.

Concrete lumber for fireproofing. Science News Letter. v. 31, no. 830. March 6, 1937. p. 153. Concrete lumber is now being used for fireproof construction, reports Oliver Bowles of the U.S. Bureau of Mines. One-inch boards are coated with finely-bonded concrete. It is used for ceilings, floors, roofs and partitions. When applied to steel frame a fireproof frame house may be built.

Building Materials. (Cont'd)

Wire mesh gives clay tile partition greater lateral strength. By Charles H. Fork. Brick & Clay Record. v. 90, no. 3. March, 1937. p. 154-155. Report of test to determine the effectiveness of wire mesh embedded in plaster to resist bending stresses. Investigate sound resistance in tile.

Cold Frames.

How to build a cold frame. Nebraska Farmer. v. 79, no. 6. March 13, 1937. p. 22.

Conduits.

Economic sizes of pressure conduits. By Julian Hinds. Engineering News-Record. v. 118, no. 12. March 25, 1937. p. 443-449. By balancing pipe investment against capitalized cost of friction loss the most economical size adjustment is determined. Convenient graphical methods may be used.

Cotton and Cotton Ginning.

Cotton research laboratory. Acco Press. v. 15, no. 3. March, 1937. p. 4. Proposed new instrument to further use of cotton.

Improving cotton gins for better service. By C.A. Bennett and F.L. Gerdes. Cotton Ginners' Journal. v. 8, no. 6. March, 1937. p. 5, 10-12.

Method for the control of cotton root rot in the irrigated southwest. C. J. King. Washington, D. C., 1937. 10p. U.S. Department of Agriculture. Circular no. 425.

Cotton Machinery.

I. H. C. cotton picker. Arizona Producer. v. 15, no. 25. March 15, 1937. p. 7, 33. They are on right track at last, but possibility of mechanical cotton pickers being produced and sold in quantities which would revolutionize agriculture in the South in near future is indeed very remote.

I. H. C. develops cotton picker. Implement and Tractor. v. 52, no.6. March 20, 1937. p. 21.

Dams.

General Markham denies that dams caused Ohio flood. Engineering News-Record. v. 118, no. 10. March 11, 1937. p. 387. Ohio river has been transformed into waterway suitable for barge navigation throughout year by construction of a series of 47 locks and dams which provide slack water pools at low water, and afford channel not less than 9 feet in depth. Before improvement of Ohio river was undertaken by federal government depth available to navigation on worst shoals

Dams. (Cont'd)

was but one foot at low water. These dams are typically constructed of wickets or shutters that are lowered flat on bottom when river rises and offer no obstruction whatever to flood flows. They do not cause any deposit of silt in river bed for reason that during period when river is carrying any considerable amount of silt, dams are down and river currents are unimpeded. Little silt is carried at low water when dams are up, and whatever minor deposits may be made at such times are carried out with first rise. Dams when lowered produce no visible disturbance on river surface. River flows as smoothly over them as in any other portion of its course. In upper part of river a few dams of a different type have been constructed. These have gates which are raised at high water, leaving series of piers through which river flows as it flows through piers of a bridge. Such dams, while affording slightly greater obstruction to flood flows than do wicket dams, have no more influence on flood heights than many bridges crossing the river.

Practical soil mechanics for small dams. By Denzil Doggett. Engineering News Record. v. 118, no. 11. March 18, 1937. p. 409-412. Grain-size analysis, Proctor density test, compaction with sheepsfoot-rollers and California section advantageously employed.

Selection of materials for rolled-fill earth dams: Discussion. By Joel B. Cox, Stanley M. Dore, John M. Field, William P. Creager and Joseph Jacobs. Proceedings of American Society of Civil Engineers. v. 63, no. 2. February, 1937. p. 361-380.

Selection of materials for rolled-fill earth dams: Discussion. By C.H. Kadie, Jr., and Ralph Bennett. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 594-597.

Seminoe dam. 1. Site exploration and design studies. By Kenneth B. Keener. Engineering News-Record. v. 118, no. 11. March 18, 1937. p. 395-399. Concrete arch dam on North Platte river in Wyoming will store water for Casper-Alcove irrigation project and provide a head for power generation.

Diesels.

Diesel engines - their fuels and comparative efficiency. By Arch L. Foster. National Petroleum News. v. 29, no. 4. January 27, 1937. p. 57-58.

Diesel engine maintenance. By James G. Thompson. California Cultivator. v. 84, no. 5. February 27, 1937. p. 141, 167. Part II.

Diesel-engine maintenance, operating, and outage data. By Lee Schneitter. Mechanical Engineering. v. 59, no. 2. February, 1937. p. 83-88, 102. Purpose of paper is to make accessible to Diesel engineers, operators and prospective purchasers, information assembled by author in course of studies relating to certain important operating problems. It is hoped also to encourage others to undertake investigations of similar nature.

Diesels. (Cont'd)

Diesels are doing it. By Herbert Acason. Western Farm Life. v. 39, no. 4. February 15, 1937. p. 8, 24. Heavy power at low fuel cost finds favor on western well pump irrigation farms.

Diesels in agriculture. By L.J. Fletcher. Penn State Farmer. v. 2, no. 6. March, 1937. p. 180, 183.

Drainage.

Bibliography on land drainage. Compiled by Dorothy W. Graf. Washington, D.C., U.S. Bureau of Agricultural Engineering, 1936. 245 p. mimeographed.

Drainage basin problems and programs. By Abel Wolman. Engineering News-Record. v. 118, no. 13. April 1, 1937. p. 476-478. Concise statement of drainage basin report of Water Resources Committee outlining its principal features limitations and recommendations.

Electric Service, Rural

Suggests anchors for rural line grounds. By A.R. Carson. Electrical World. v. 107, no. 13. March 27, 1937. p. 76. Table gives comparison of ground resistance of anchors and their rods with adjacent ground rods.

Electric Wiring.

Economy and efficiency through complete wiring. By H.G. Knoderer. Electrical Ruralist. v. 1, no.1. May, 1937. p. 22-23.

Electricity-Distribution.

Industry now serving over one million farm homes. Edison Electric Institute Bulletin. v. 5, no. 3. March, 1937. p. 87. Gives number and percentage of farms receiving electric service.

Electricity in the Home.

Domestic electric appliances in 1936. Edison Electric Institute Bulletin. v. 5, no. 3. March, 1937. p. 74. Gives Kilowatt-hours used by various appliances in domestic electric service since 1920.

Let electricity be your servant. Southern Planter. v. 98, no. 3. March, 1937. p. 5.

Electricity on the Farm.

Brooding chicks under electric hovers. F.L. Fairbanks and J.H. Brucknor. Ithaca, N.Y., 1937. 23 p. New York College of Agriculture at Cornell University. Extension bulletin no. 366.

Electricity on the Farm. (Cont'd)

Equipment and electricity. Hoard's Dairyman. v. 82, no. 3. February 10, 1937. p. 85. Discussion of survey made by Pacific Light and Power Company.

Increasing the farm use of electricity. By H.J. Gallagher. Agricultural Engineering. v. 18, no. 3. March, 1937. p. 101-103.

Europe leads America in electric plow experiments. Rural Electrification News. v. 2, no. 7. March, 1937. p. 20-21. Problem of whether it would be economically feasible to substitute electric power for other sources of mechanical and animal power, for plowing, interests those seeking to increase the use of electricity in agriculture. Continental Europe leads in development of such machinery. Main impetus is derived from lack of domestic oil reserves as driving power for internal combustion motors. Many systems were designed for this purpose. Two types in particular are predominant; one of large dimensions for use of contractors or cooperative ownership, other for individual farmers and market gardners.

Problems of rural electrification. By G.C. Neff. Electric Journal. v. 34, no. 3. March, 1937. p. 95-97. If the electrification is to have a sound foundation other major problems must first be satisfied; wiring must be adequate, safe, economical; farm machinery must be redesigned to use the new power; the farmer must be shown how to use electric power effectively and economically.

Rural electrification, -- A promise to American life. Harcourt A. Morgan. Knoxville, Tenn., Tennessee Valley Authority, 1936. 36p. Paper presented before Third World Power Conference.

Uses for electricity in growing and marketing plants. By G.A. Rietz. Penn State Farmer. v. 2, no. 6. March, 1937. p. 181, 207, 209-210.

World Power Conference papers on rural electrification. Edison Electric Institute Bulletin. v. 5, no. 3. March, 1937. p. 79-86, 88, 92.

Engineering.

Engineering in an American program for social progress. Karl T. Compton. Science. v. 85, no. 2203. March 19, 1937. p. 275-280. Part 1.

Engineering in an American program for social progress. Karl T. Compton. Part II. Science. v. 85, no. 2204. March 26, 1937. p. 301-305. Conclusions as to our policy in regard to role of engineers in this program for social progress are quite clear. Engineers should be given more important role in determination of national policies directed toward this program. They should be given encouragement and stimulation which will lead to their best performance in achieving many of

Engineering. (Cont'd)

these objectives. Their environment, whether in government or industry or educational institution, should be made conducive to productive effort.

Erosion Control.

Contour planting and irrigation of orchards to control erosion. By D.C. Craig. Utah Farmer. v. 57, no. 15. March 10, 1937. p. 3. Advantages of pipe line and contour irrigation furrow system are as follows: 1. Duty of water is greater due to control of flow and avoidance of waste. 2. Seepage losses are reduced to minimum. 3. Water can be run under pressure across low spots and ridges. 4. Expense of cleaning and maintaining open ditches is eliminated. 5. Pipe line does not interfere with cultivating operations. 6. Erosion of topsoil is minimized by absolute control of amount of flow delivered to each furrow. 7. Soil fertility losses due to excessive deep percolation are reduced. 8. More uniform wetting of all of ground, insuring better tree growth and larger crops.

Early erosion-control practices in Virginia. A.R. Hall. Washington, D.C. 1937. 31p. U.S. Department of Agriculture. Miscellaneous publication no. 256.

Emergency wind-erosion control. Glenn K. Rule. Washington, D. C. 1937. 11p. U.S. Department of Agriculture. Circular no. 430.

Preventing soil blowing on the Southern Great Plains. E.F. Chilcott. Washington, D. C., 1937. 29p. U.S. Department of Agriculture. Farmers' bulletin no. 1771

Research in Iowa in soil erosion, soil conservation and related land use planning. R.E. Buchanan. Ames, Iowa, Agricultural experiment station, 1936. 47p. mimeographed.

Trees to control erosion. By C.C. Starring. Montana Farmer. v. 24, no. 13. March 1, 1937. p. 3. Single hedge rows have great possibilities.

Evaporation.

Determining evaporation losses from weather bureau data. By Adolph F. Meyer and A.S. Levens. Engineering News-Record. v. 118, no. 13. April 1, 1937. p. 481-483. Restudy of evaporation formula confirms its practical value and defines new coefficient applicable to computation of water losses from large lakes.

Farm Buildings and Equipment.

Headin' off another breakdown. By Mack M. Jones. Missouri Ruralist. v. 78, no. 3. February 6, 1937. p. 3, 21. One of most profitable farm improvements is a building for farm shop and implements. Often this also serves as garage, leaving room for shop, car and whatever machine is being repaired. Cheaper addition always can be built on

Farm Buildings and Equipment. (Cont'd)

for housing other machinery if wanted. It is here on days when outside work is impossible that farm equipment may be gone over and kept in readiness for good weather.

New idea in self-feeders for hogs. Hoard's Dairyman. v. 82, no. 2. January 25, 1937. p. 57.

Practical farm milk house. By C. H. Jefferson. Hoard's Dairyman. v. 81, no. 22. November 25, 1936. p. 578. Gives working drawing of milk house with cooling tank for 4 cans, designed by Agricultural Engineering Department of the Michigan College of Agriculture.

Farm Income.

Comparative income status of farmers. Farm Implement News. v. 58, no. 6. March 25, 1937. p. 37. Farm operators, insofar as income and purchasing power are concerned, were not at an economic disadvantage in relation to other gainfully-employed workers in the United States during normal post-war years, according to new estimates of agricultural income published by National Industrial Conference Board. New estimates include not only income from agricultural operations, but substantial additional income that farmers receive for work done off their farms. They also value farm income received in kind at retail prices paid by urban workers instead of at farm prices. In addition, Board's estimates make available for first time estimates of net agricultural income by geographic regions. These show that average farm income for country as a whole is materially lowered by concentration of 54% of all farm operators in the South, and generally low income conditions in that area.

Farm Machinery and Equipment.

"Baby" combine. By R. A. Crosby. Penn State Farmer. v. 2, no. 6. March, 1937. p. 182, 212, 214.

Century of plow progress. By Clyde M. Brundy. Western Farm Life. v. 39, no. 4. February 15, 1937. p. 15, 21. No modern implement appears so simple, yet is so complex and so scientifically made.

Cost of operating farm equipment. Farm Machinery and Equipment. no. 1838. February 15, 1937. p. 26.

Crop rotation and tillage experiments at the northern great plains field station, Mandan, N. Dak. J. T. Sarvis and J.C. Thysell. Washington, D.C., 1936. 76p. U.S. Department of Agriculture. Technical bulletin no. 536.

Farm equipment and National programs. By Arnold P. Yerkes. Penn State Farmer. v. 2, no. 6. March, 1937. p. 184, 212. It is evident that we are confronted with one of those "vicious circles." If we had more good farmers the market which they create for city products would give employment to more city workers. At the same

Farm Machinery and Equipment. (Cont'd)

time, the more farmers we have, the smaller is each one's share of city market and the less his buying power, which in turn reduces employment for city workers. Just how this circle can be broken and more desirable conditions produced is something which many people have tried to figure out. If it could be solved agricultural problems would also be solved.

Farm equipment for 1937, both new and improved. Wisconsin Agriculturist and Farmer. v. 64, no. 4. February 13, 1937. p. 19, 30.

Harvesting with combines. W. M. Hurst and W.R. Humphries. Washington, D.C., 1936. 37p. U.S. Department of Agriculture. Farmers' bulletin no. 1761.

How to fit a cross-cut saw. By L.M. Roehl. American Agriculturist. v. 134, no. 2. January 16, 1937. p. 3, 19.

Load studies on tillage tools. By A.W. Clyde. Agricultural Engineering. v. 18, no. 3. March, 1937. p. 117-121. Summary. Mechanics of finding useful soil force on tool, (or combined useful and parasitic friction forces, if desired), are explained. 2. Useful soil force on plows and disks is usually made up of non-concurrent parts. 3. Speed type moldboard plow required less draft at both $2\frac{1}{2}$ and $4\frac{1}{2}$ mph than one of conventional shape. 4. USDA self-aligning disk jointer in heavy plowing gave substantial reduction in total draft, but increase in side force, as compared with colter and jointer equipment. 5. Examples are given of using soil force measurements for computing bearing loads on disk jointer and disk plow. 6. Commonly used "center of resistance" rule for plow hitches is wrong because it takes no account of weight of tool, nor of varying soil forces. 7. Data on soil forces permits planning of shop tests which will load an implement part in a manner similar to its field loading.

Machine-made jobs. By Machinery and Allied Products Institute. Better Farm Equipment and Methods. v. 9, no. 7. March, 1937. p. 4-5, 25-26. Some pertinent "Buts" and "Ands" in the discussion of technological changes.

New bean thresher developed. California Cultivator. v. 84, no. 5. February 27, 1937. p. 158. Reducing damage to beans from average of 30 percent to approximately 2 percent, and recovering 99.5 percent of beans taken into machine, a new bean thresher developed by agricultural engineering division of University of California may revolutionize bean harvesting methods and save millions of dollars to growers. Instead of having a cylinder of peg teeth revolving in concaves also filled with teeth, new thresher merely rolls beans and straw between two large, rubber-covered rollers. There are three sets of these rollers, mounted in pairs, lower ones driven by chain belt, and upper ones given pressure by springs, rolling with others as straw passes through.

New machine for scarifying terrace channels. By William A. Weld. Soil Conservation. v. 2, no. 9. March, 1937. p. 214.

Farm Machinery and Equipment.(Cont'd)

Oliver 6-foot combine - the grain master. Farm Implement News. v. 58, no. 5. March 11, 1937. p. 36-37.

Oliver's grain master makes bow. Implement and Tractor. v. 52, no.5. March 6, 1937. p. 20-21. Small combine with six-foot cut, offered as a low-cost harvest unit for wheat states and diversified areas, is operated from power take-off.

Production and sales of tractors, combines and threshers in 1936. Farm Implement News. v. 58, no. 7. April 8, 1937. p. 24-25.

Recent investigations and experiments regarding soil cultivation. Monthly Bulletin of Agricultural Science and Practice. v. 38, no. 3. March, 1937. p. 82-89.

See that the machines are ready. By Research Department Farm Equipment Institute. Farm Machinery and Equipment. no. 1838. February 15, 1937. p. 38.

Small combine harvester thresher. By E.C. Sauve. Michigan. Agricultural Experiment Station. Quarterly Bulletin. v. 19, no. 3. February, 1937. p. 162-164. Conclusions: Small combine gives promise of widespread acceptance by farmers in Michigan, based on 1936 survey. This is especially true of small grain farmer who does not find it necessary to collect large amounts of straw. Five-or six-foot combines, reasonably priced, will give satisfaction and economy to their owners, particularly when some contract work is available to help reduce costs to farmers with small acreages of grain. A successful 1936 combine harvest gives promise of greater acceptance of this labor-saving machine for 1937.

Tests of tillage tools. 1. Equipment and procedure for moldboard plows. By I.P. Reed. Agricultural Engineering. v. 18, no. 3. March, 1937. p. 111-115.

Tillage tool research. By A.W. Clyde. Penn State Farmer. v. 2, no. 6. March, 1937. p. 175, 218. Design for strength. Hitches. Effect of various shapes and angles of tools. Methods being used.

Two-row cultivator converted into a weed control machine. D. E. Wiant and R.L. Patty. Brookings, S. D., 1936. 8 p. South Dakota, Agricultural experiment station. Bulletin no. 303.

Why disk harrows act that way. By A.W. Clyde. Farm Implement News. v. 58, no. 6. March 25, 1937. p. 30-31.

Fences.

Effect of treatment on fence posts. J.C. Wooley. Columbis, Mo., 1937. Missouri. Agricultural experiment station. Bulletin no. 374.

Fences. (Cont'd)

New ideas in fencing. By H.P. Smith. Farm and Ranch. v. 56, no. 2. January 15, 1937. p. 3, 11.

Preservative treatment of fence posts. By Don Drummond. Utah Farmer. v. 57, no. 15. March 10, 1937. p. 7.

Fertilizer Placement.

Better methods of fertilizer application widely used. Fertilizer Review. v. 12, no. 2. March-April, 1937. p. 8-9, 14. Bureau of Agricultural Engineering of the U.S. Department of Agriculture has estimated that there are in use on American farms approximately 5,000,000 machines that apply fertilizer either at time of planting, or as separate operation before or after planting. A very large proportion of these machines are 10, 15 or 20 years old, and most of older machines are more or less obsolete, in so far as method of fertilizer application is concerned. In many cases machines that are otherwise in good condition can be modernized by purchasing new parts or attachments. However, farmers who own obsolete fertilizer-distributing machines which can not be modernized would be money ahead if they would discard these machines and purchase new ones. In many cases new machine will pay for itself in single season.

More profit from improved placement of fertilizer. Farm Implement News. v. 58, no. 6. March 25, 1937. p. 29.

Placement of commercial fertilizers. Address by L.F. Woods. Pacific Rural Press. v. 132, no. 21. November 21, 1936. p. 570.

Floods and Flood Control.

Control of great floods. By Arthur E. Morgan. Engineering News-Record. v. 118, no. 11. March 18, 1937. p. 401-403. Task of unprecedented magnitude, flood control requires that every possible method be studied, including headwater and soil control. It should be treated as part of integrated river control for all purposes.

Economic aspects of flood control. By Nathan B. Jacobs. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 441-448. Flood control is a problem of applied economics in which social security and protection of life and property must be evaluated in balancing annual savings from flood control against cost of construction and maintenance. Floods damage homes of those least able to bear the cost who only live in path of inundation because financially unable to move elsewhere. No formula has yet been developed to apportion costs of such works satisfactorily between Government (Federal, State, and Local) and property owners, but each plan represents a problem for solution not only in its engineering aspects but also in distributing costs.

Federal plans for flood control. By W.E.R. Covell. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937.

Floods and Flood Control. (Cont'd)

p. 523-537. It was natural that watercourses and their valleys should have had great influence in early settlement, trade and transportation of United States since they were lines of least resistance to vast unexplored inland country. Later, devastating floods occurred in valleys, and protective measures were sought. First flood protection sponsored by Federal Government was in Mississippi Valley followed by protection in Sacramento county, California. In 1925, Federal interest in river planning of broad scope was manifested, which later resulted in "308" reports of the Corps of Engineers, U.S. Army, covering possibilities of navigation, flood control, water power, and irrigation. By June 30, 1936, nine Federal flood-control projects were in force which were followed by twenty-seven additional projects throughout the country to June 22, 1936, when general Flood Control Act was approved. Federal policy was thereby established, 219 main flood-control items were authorized in 46 major basins and localities, and 232 localities were designated for further investigation. Fourteen reservoirs were authorized for protection of Pittsburgh, Pa., and Ohio Valley, based upon "308" reports. General features of reservoir system, which contemplates control of flood waters at or near their source, are presented.

Federal responsibility for flood control. By James J. Davis. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 423-428.

Flood conditions in New England. By W. F. Uhl. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 449-483. There is no complete practical solution but numerous partial solutions can be offered. Many of these are suitable only where peculiar conditions make them practical. Even where there is a practical solution, it may not be economically feasible. In New England, one of methods which appears economically feasible is to build reservoirs designed for storage, which afford a large measure of flood protection as a by-product. Statistical data collected on 1927 and 1936 floods have materially increased information available on magnitude of flood flows.

Flood plan drafted for New England. Engineering News-Record. v. 118, no. 14. April 8, 1937. p. 533, 536. Sub-committee completes draft of interstate compact for flood control in Connecticut Valley.

Flood protection data. Progress report of the Committee: Discussion. By C.H. Eiffert. Proceedings of American Society of Civil Engineers. v. 63, no. 2. February, 1937. p. 406-408.

Flood protection data: Progress report of committee. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 539-544.

Floods in upper Ohio River and tributaries. By E.K. Morse and Harold A. Thomas. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 495-518. Object of paper is to describe outstanding characteristics of unprecedented flood of March, 1936, in Upper Ohio River and its tributaries; to point out causes which com-

Floods and Flood Control. (Cont'd)

bined to bring about occurrence of this flood, and to outline history of present flood-control program for these rivers. Recommendations are made for improving facilities and technique used in forecasting floods in this region.

Great model shows engineers how to prepare for floods. Science News Letter. v. 31, no. 827. February 13, 1937. p. 99-100. U. S. waterways experiment station at Vicksburg condenses 602 miles of Mississippi into 1,100 feet.

Ideal organization for the river and flood service of the United States Weather Bureau. By Montrose W. Hayes. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 519-522. Flood forecasts may be based on river-gage relations, or on rainfall data, or on both. Demand for flood forecasts has grown rapidly, and standard of refinement insisted upon, is constantly increasing. This makes necessary establishment of additional observation stations, and development of more precise methods of prediction. A plan for improving river and flood service of United States Weather Bureau is presented.

New York floods of 1935 and 1936. By Arthur W. Harrington and Hollister Johnson. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 485-493. Although records relatively long for this region, indicated favored location in respect to occurrence of great storms, within nine months New York State was visited by two major floods, one in July, 1935 and other in March, 1936. Flood of July, 1935, was caused by a storm of thunder-shower type of unusually large aereal extent in south-central part of State. Many small streams had peak discharges of more than 2,000 cubic feet per second per square mile. Damage, especially severe along small streams, might well be called dynamic damage. Flood of March, 1936, was caused by moderate rains and melting snow which produced record-breaking discharges, both peak and total, on larger streams, chiefly in Hudson and Susquehanna River basins. Damage was caused principally by inundation along larger streams. More and better hydrologic records are needed as part of basic data for design and operation of flood preventive and control projects, and solution of problems of engineering economics involved.

Problems in developing a national flood-protection policy. By Abel Wolman. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 429-439. Presents brief analysis of various aspects of determining upon a national flood-protection policy, and to outline what measures are under way, as of 1937, to clarify some of problems involved.

Back-water and drop-down curves for uniform channels: Discussion. By Boris A. Bakhmeteff. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 556-558.

Flow characteris in elbow draft-tubes. By C.A. Mockmore. Proceedings of American Society of Civil Engineers. v. 63, no. 2. February,

Floods and Flood Control. (Cont'd)

1937. p. 251-286. Purpose of this study was to investigate flow characteristics in elbow draft-tube, placing special emphasis on bent part of tube. First part of study consisted of designing and building several different pipe bends and testing them with a Pitot tube for filamental velocities and pressures. Measurements for loss of head were made for various rates of flow to determine which shape of bend offered least resistance to flowing water. Second part of study involved design, construction, and testing of several model draft-tubes, patterned after type of those at Bonneville Dam, on Columbia River, in Oregon. Model draft-tubes, as well as experimental pipe bends, were made of pyralin, a transparent material through which it was possible to take photographs of phenomena. Motion pictures were made for all conditions of flow in pipe bends and draft-tubes. Tests indicated that pipe bend which was flattened in direction of plane of bend offered less resistance to flow than any of other bends, regardless of cross-sectional area. It also appeared that distance between inside and outside walls at outlet of bend of elbow draft-tube should be small compared to throat diameter of tube.

Use of an elbow in a pipe line for determining the rate of flow in the pipe. By Wallace M. Lansford. Urbana, Ill., 1936. 36p. Illinois. Engineering experiment station. Bulletin no. 289.

Varied flow in open channels of adverse slope: Discussion. By Arthur E. Matzke. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 545-546.

Fruit Harvesting.

Harvesting and handling citrus fruits in the Gulf States. J.R. Winston. Washington, D.C., 1937. 38p. U.S. Department of Agriculture. Farmers' Bulletin no. 1763.

Hay.

High-grade alfalfa hay: Methods of producing, baling, and loading for market. Edward C. Parker and W. H. Hosterman. Washington, D.C., 1936. 30p. U.S. Department of Agriculture. Farmers' Bulletin no. 1539.

Hay Drying.

Losses of organic substance in the spontaneous heating of alfalfa hay. By E.J. Hoffman and M.A. Bradshaw. Journal of Agricultural Research. v. 54, no. 3. February 1, 1937. p. 159-184.

Hotbeds.

Present state of the technique in heating hotbeds by electricity. Monthly Bulletin of Agriculture and Practice. v. 38, no. 2. February, 1937. p. 37-51. Electric soil heating presents very considerable advantages: 1. Necessary apparatus for electric heating can be rapidly installed, while considerable time and labor are re-

Hotbeds. (Cont'd)

quired for making manure beds. 2. Even heat can be obtained in any part of the hotbed, by electric heating and as opposed to manure, without giving off vapor, and especially ammonia vapor which may be harmful to plant growth, causing the plants to rot. In manure hotbeds, heat concentrates in center and plants set near edges are slow in growing and inferior in quality. Soil temperature best suited to any particular plant can be selected and maintained by thermostatic control. This greatly improves growing conditions and prevents plant losses due to extremes of temperature. 3. Crops may be advanced or retarded at will, so higher prices may be obtained. 4. Electric hotbed can be used in the autumn. 5. Several successive crops may be raised per season without moving soil in bed to replace manure (heating value of manure only lasts about 6 weeks. 6. Well-installed electric hotbed will last 6 years or more. 7. It is easier to convert it into cold bed during periods of apparent repose or initial growth phases, thus eliminating necessity of transplanting. 8. It is possible that electric current has direct influence on plants. Advantages of electric hotbeds in respect of greenhouses for plant raising are as follows: 1. Initial cost of installation is not excessive. 2. There is no further necessity for supplementary beds to harden plants before transplanting. 3. Use of plant-boxes as is usually practised in greenhouses is not required. 4. Less labor is required in raising plants in electric hotbed than in greenhouse.

Soil heating is profitable now. By E.J. Gildehaus. Electrical Ruralist. v. 1, no. 1. May, 1937. p. 24-25.

Sweet potato hotbeds. Arizona Producer. v. 15, no. 22. February 1, 1937. p. 8. Fire is best method of heating, electricity next, manure can't be recommended.

There's profit in soil heating for the small grower. By Lawrence E. Goble. Electricity on the Farm. v. 10, no. 3. March, 1937. p. 7-9.

Houses.

Cost analysis of an all-wood house. By C. Paul Ulmer. American Builder and Building Age. v. 59, no. 3. March, 1937. p. 90-94, 138, 140, 142, 144. Purdue Housing Research project.

Exterior walls of concrete house completed in one day. Engineering News-Record. v. 118, no. 11. March 18, 1937. p. 403-404. Use of vacuum process by which excess water is rapidly forced out of freshly poured concrete permits quick removal of forms followed by application of a stucco surface before final set has occurred.

Farm houses that farm families want. By Ruby M. Loper. Agricultural Engineering. v. 18, no. 3. March, 1937. p. 122-123.

Here's Midwest's first modernistic farm home. Prairie Farmer. v. 108, no. 19. September 12, 1936. p. 5, 14.

Hydrology.

Measuring equipment used in watershed and hydrologic studies. By W.D. Ellison. Agricultural Engineering. v. 18, no. 3. March, 1937. p. 107-110.

Insect Control.

Controlling insects with light traps. By W.B. Herms and J.K. Ellsworth. Pacific Rural Press. v. 133, no. 7. p. 212. Insect electrocutors, eight inches in diameter and eighteen inches in height, consist of a wire cage of stainless steel, alternate wires being connected through high tension procelain insulation to terminals of transformer embedded in compound in its metal container, which supplies enough voltage to electrocute insects as well as to furnish sufficient current for luminescent tube. This tube, helical in shape, is used as a lure and is suspended in center of cage so that insects will come in contact with wires as they fly toward light. These tubes are designed to burn 50,000 hours, or nightly for approximately ten years.

Plowing as a means of destroying wireworm pupae in the Pacific Northwest. F. H. Shirck. Washington, D. C., 1936. 8p. U.S. Department of Agriculture. Circular no. 407.

Insulation.

Asbestos insulation applied to walls with spray gun. Popular Mechanics. v. 66, no. 6. December, 1936. p. 889. Asbestos insulation in colors to match your decorative scheme can be applied with spray gun to ceiling, walls, or even to pipes. Applied like paint, it adheres readily to metal, wood, cement, brick or plaster, providing a fireproof surface that conserves heat and aids in soundproofing. Square foot of sprayed asbestos an inch thick weighs only six to eight ounces, thus no additional supports are needed to carry its weight on ceiling.

Insulation materials studied. By W.M. Rees. Wisconsin Agriculturist and Farmer. v. 64, no. 4. February, 1937. p. 20.

Low cost insulating brick for home construction. Brick & Clay Record. v. 90, no. 3. March, 1937. p. 190. Research problem was undertaken at North Carolina State College at Raleigh, to determine possibility of producing low cost insulation unit from North Carolina raw materials for use particularly in house construction. As result of tests, it was indicated that most satisfactory mixtures were Triassic shale, 55 per cent; sawdust or hulls, 45 per cent; and precambrian shale 60 per cent.

New roofs over old provide good insulation. Wisconsin Agriculturist and Farmer. v. 64, no. 3. January 30, 1937. p. 17.

Irrigation.

Furrow irrigation and equipment. By O.W. Howe. Farm Implement News. v. 58, no. 6. March 25, 1937. p. 32-33.

Irrigation. (Cont'd)

Influences of irrigation upon important small fruits. W.S. Brown. Corvallis, Ore., 1936. 37p. Oregon. Agricultural experiment station. Bulletin no. 347.

Irrigation in Oregon. By Charles E. Stricklin. New Agriculture. v. 19, no. 6. March, 1937. p. 9.

Irrigation of sugar beets. By J.E. Coke. Pacific Rural Press. v. 132, no. 23. December 5, 1936. p. 637.

Lesson in irrigation. By W.S. Acton. Montana Farmer. v. 24, no. 9. January 1, 1937. p. 9.

Money from artificial rain. By C.J. Hurd. Electricity on the Farm. v. 10, no. 3. March, 1937. p. 14-15, 18. Table gives gallons per acre required for overhead irrigation.

Supplemental irrigation of eastern orchards. By F.E. Staebner. Blue Anchor. v. 14, no. 3. March, 1937. p. 12-13, 20.

Lighting.

The way and the light in rural homes. By Helen G. McKinley. Magazine of Light. v. 6, no. 3. March, 1937. p. 8-12.

Lightning.

Lightning protection of farm buildings. By W.L. Lloyd, Jr. Agricultural Engineering. v. 18, no. 3. March, 1937. p. 105-106. Properly designed and installed lightning rod system comprises the following: 1. Sufficient number of conducting points (called air terminals) so located about upper parts of structure that all parts likely to receive and to be damaged by stroke of lightning are prevented from receiving stroke which contacts, instead, one or more of these points. Number and location of air terminals are important. 2. Network of conductors interconnecting air terminals to conduct discharge over roof and down side walls of structure to ground connection. Size of conductor, method of interconnecting the points, and number and location of down conductors are important. 3. System of ground connections to conduct enormous current of stroke harmlessly to ground. 4. System of conductors interconnecting or grounding, or both interconnecting and grounding all extensive bodies of metal within or about structure to be protected.

Lubrication.

Proper lubrication essential. By A.H. Hollenberg. Farm Machinery and Equipment. no. 1838. February 15, 1937. p. 24. Longevity of farm equipment depends upon careful and intelligent servicing.

Why lubrication is essential. Better Farm Equipment and Methods. v. 9, no. 7. March, 1937. p. 6-7.

Lubrication. (Cont'd)

With oil can and grease gun. By J.E. Nicholas. Breeder's Gazette. v. 102, no. 3. March, 1937. p. 6. Maximum efficiency in farm machinery is impossible with incorrect lubrication. Increased power requirements and wear of parts, necessitating early repairs and shortening life of equipment, as well as decreased production because of loss in time and increased overhead and operating expense will come with this practice. In contrast correct lubrication minimizes wear and repairs and prolongs useful life of farm machinery, thus substantially reducing operating repair and overhead costs. Time required to properly care for lubrication is many times offset by increased output of useful work.

Miscellaneous.

How to profit by new inventions. By Malcolm McDonald. Magazine of Wall Street. v. 59, no. 11. March 13, 1937. p. 696, 722.

Report of progress for year ending June 30, 1936. Orono, Me., 1936. 389-443 p. Maine. Agricultural experiment station. Bulletin no. 384. Cost of growing potatoes, p. 412-417. Cost of harvesting potatoes p. 417-419. Cost of storing potatoes, p. 419-421. Motive power on Central-Maine potato farms, p. 424-427.

Motors.

Choosing right motor for gasoline pumps. By E.A. Whiting. Electrical World. v. 107, no. 13. March 27, 1937. p. 82.

Plows and Plowing.

Plow share - its construction and importance of service. By L. W. Hurlbut. Implement and Tractor. v. 52, no. 5. March 6, 1937. p. 25, 33.

Power.

Sun's rays harnessed to run steam engine. Popular Mechanics. v. 66, no. 5. November, 1936. p. 673. Discussion of work of Dr. C.G. Abbot. Smithsonian institution.

Pumps and Pumping.

Pumps and power. By Ivan D. Wood. Nebraska Farmer. v. 79, no. 6. March 13, 1937. p. 7, 28. Some vital facts for men who want to irrigate.

Reclamation.

Reclamation as an aid to industrial and agricultural balance: Discussion. By Joseph Jacobs, M. E. McInver and C.S. Jarvis. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 628-633.

Rainfall and Runoff.

Rainfall intensities and frequencies. By L.J. Schafmayer and B.E. Grant. Proceedings of American Society of Civil Engineers. v. 63, no. 2. February, 1937. p. 225-249. Investigation of relation of frequency to rainfall intensity, by statistical method, forms basis of this paper. All available records of excessive rainfall published by United States Weather Bureau for nineteen cities were first examined and those exceeding certain rates were tabulated and plotted on semi-logarithmic paper. Graphs were straight lines of marked regularity in their arrangement. Then, data from ten cities of original nineteen were tabulated and plotted, thus using about one-half quantity of data first used. Similar regularity and consistency in curves were found. Finally, data from fourteen rain-gages in Chicago (Ill.) District were used for finding curves and formulas for use of City of Chicago. Formulas for intensity are rectangular hyperbolas and are plotted on hyperbolic paper as straight lines. Study is limited to excessive storms having durations of 120 min. and less.

Refrigerants.

Certain technical aspects of "Freon" refrigerants of interest in relation to refrigeration research. By R.J. Thompson. Part 2. Agricultural News Letter. v. 5, no. 4. April, 1937. p. 72-80.

Refrigeration.

Cream cooler for dairy farms chills cream as it separates. Popular Mechanics. v. 66, no. 6. December, 1936. p. 842. Cold water is placed in galvanized iron container within which cream container is set. This is held in center and off bottom by bands adjustable with levers. In top of cream pail is a spreader which receives cream falling from separator spout, and aerates fluid as it divides into forty-eight fine streams to be cooled as it flows down cold inner wall of container.

Milk cooling is profitable. By John E. Nicholas. Electricity on the Farm. v. 10, no. 3. March, 1937. p. 10-13.

Research.

Agricultural research in China. By H.K. Hayes. Science. v. 85, no. 2205. April 2, 1937. p. 321-325. Part I.

Agricultural research in China. By H.K. Hayes. Science. v. 85, no. 2206. April 9, 1937. p. 347-350. Part II.

Purdue completes year of structural research. By Benjamin F. Betts. Architectural Record. v. 81, no. 3. March, 1937. p. 34BT-35BT, 44BT. Describes work of the Department, some of its conclusions.

University of Illinois research in heating and ventilating shows importance of structure. By E.P. Kratz. Architectural Record. v. 81, no. 3. March, 1937. p. BT41, 62 adv.

Silos.

Portable silo easy to make with paper and snow fence. Popular Mechanics. v. 66, no. 6. December, 1936. p. 819. Portable silo can be constructed of four-foot snow fencing and lined with new type of craft paper. Farmer laps slats wood to wood, and lining paper to paper, to make an airtight and waterproof enclosure when expanded from within by weight of contents. Top of filled silo is covered with about fourteen inches of packed straw soaked with water and seeded with oats. Heat produced by fermenting silage soon sprouts oats and thus provides protection against air. After silage is used fencing may be rolled up and stored until next season when it can be used with new lining. Specially treated paper is fully resistant against fungus growths and bacteria existing in all silage.

Soils.

Trace elements in the soils from the erosion experiment stations, with supplementary data on other soils. C. S. Slater and others. Washington, D.C., 1937. 24p. U.S. Department of Agriculture. Technical bulletin no. 552.

Sprays and Spraying Equipment.

Care of spray equipment. By A.H. Hollenberg. Better Farm Equipment and Methods. v. 9, no. 7. March, 1937. p. 10.

Up and at 'em via spray towers. By J.F. Fairbank. Pacific Rural Press. v. 133, no. 7. February 13, 1937. p. 199.

Storage Houses.

Housing and storing sweet potatoes. By J.R. Cooper. Southern Agriculturist. v. 66, no. 10. p. 19.

Tennessee Valley Authority.

Tennessee Valley Authority, 1933-1937. Washington, D.C., U.S. Government Printing Office, 1937. 84p.

Tires.

Air wheels on tractors speed up all work, cut down costs. By George F. Jordan. Missouri Ruralist. v. 78, no. 4. February 20, 1937. p. 15. Recent summary of work done by tractors with and without tires shows that tires on 2-plow tractor just about made it equal in work accomplished to 3-plow tractor with steel rims.

Ranching on rubber. By Elmer J. Johnson. Western Farm Life. v. 39, no.4. February 15, 1937. p. 3, 9. Western producers prove advantages of pneumatic tires on farm equipment. Disadvantages: 1. Puncture possibility, but this is rare. 2. Aging and weathering out of tires. 3. Under certain

Tires. (Cont'd)

conditions it is hard to keep guide wheels on ridges, especially side hill cultivation on sandy ground. 4. Slippage on wet surface or freshly applied manure, but use of chains will overcome this largely. 5. Added expense in refitting to rubber tires. Advantages are: 1. Saves fuel. 2. Less damage to hay in mowing. 3. Better traction in sand. 4. Increased power on drawbar. 5. Adaptable to more farm jobs. 6. Can use smaller, less costly tractor. 7. Less vibration reduces wear, and increases comfort of driver. 8. Less soil packing and digging in. 9. Increased life of tractor due to less vibration, shock and wear. 10. Increased speed permits more work to be done. 11. Less dust and sand scattered over machine and driver. 12. Tread does not fill up with dirt and trash as do lugs. 13. Better suited to road work. Lugs often violate road laws. 14. Less damage to trees, roots and shrubs. 15. Reduced rolling resistance. 16. Tire will not catch clothing as will lugs.

Tractors.

More facts about all-purpose tractors. Wisconsin Agriculturist and Farmer. v. 64, no. 4. February 13, 1937. p. 18.

More jobs the tractor gets the less it costs to run. By M.M. Jones. Missouri Ruralist. v. 78, no. 4. February 20, 1937. p. 18. Figures include all costs - depreciation, repairs, housing, interest, and fuel and oil costs.

Tractor major influence on farm economics. Society of Automotive Engineers Journal. v. 40, no. 2. February, 1937. p. 47-48. Digest of paper by V.P. Rumely at 1937 S.A.E. annual meeting.

Tractors on United States farms. Farm Implement News. v. 58,no. 7. April 8, 1937. p. 25. An estimate as of April 1, 1937.

Valves.

Valve materials and valve users. By C.W. Smith. Implement and Tractor. v. 52, no. 5. March 6, 1937. p. 24. Such factors as warping, poor heat transmission, scaling, excessive expansion and closing of valve and tappet clearances show the fallacy of using cheap replacements.

Ventilation.

Successful ventilation. By Roy E. Jones. New England Homestead. v. 110, no. 2. January 16, 1937. p. 19.

Water Conservation.

Water conservation and control. By John C. Page. Reclamation Era. v. 27, no. 3. March, 1937. p. 46-49.

Water Rights.

Administrative control of underground water; physical and legal aspects:

Water Rights. (Cont'd)

Discussion. By Wells A. Hutchins. Proceedings of American Society of Civil Engineers. v. 63, no. 2. February, 1937. p. 323-328.

Administrative control of underground water: physical and legal aspects: Discussion. By John E. Field, George S. Knapp and Chandler Davis. Proceedings of American Society of Civil Engineers. v. 63, no. 3. March, 1937. p. 547-555.

Groundwater law in Arizona and neighboring states. G.E.P. Smith. Tucson, Ariz., 1936. 91p. Arizona. Agricultural experiment station. Technical bulletin no. 65.

Water Supply.

Building a river in the desert. Popular Mechanics. v. 66, no. 5. November, 1936. p. 682-685, 120A, 122A, 124A.

Transmountain water diversion worth millions to growers. Through the Leaves. v. 25,no. 2. March, 1937. p. 47-51. Transmountain diversion will mean annual income increase of $8,000,000 to $10,000,000 to farmers in northern and eastern Colorado. It was shown that: 1. Diversion of 320,000 acre feet of water from headwaters of Colorado river will not interfere with present water rights on western slope, or any possible future needs there. 2. Rather than interfering with scenic beauty of Grand Lake area, it will enhance its beauty by increasing acreage of mountain lakes, always a tourist attraction. 3. Increased supply of water will stabilize northern Colorado agriculture, do away with lean years of short water and raise general level of production. Average yield of sugar beets would be increased by three tons an acre. 4. Water it provides would cost at present estimates $2.00 an acre foot plus about 15 cents for operating expense.

Utah, Idaho, Wyoming to study Green and Bear River project. Engineering News-Record. v. 118, no. 11. March 18, 1937. p. 426. Compact for preliminary study of proposed Green River-Bear River diversion, which is expected to lead ultimately to construction of irrigation and power project of large size, has been agreed upon by Utah, Idaho and Wyoming. Project contemplates a dam on Green River 12 miles above Daniels, Wyoming, to store 300,000 acre-feet. Conduits some sixty miles long would carry water from this dam to head of Twin Creek in Wyoming whence it would flow naturally into Bear River to supplement natural flow. Natural flow of Bear River would be stored in Coyote reservoir and two other reservoirs. Irrigation water would be provided for some 135,000 acres in Utah, 50,000 in Idaho and 65,000 in Wyoming.

Water supply for orchards. R. A. Jennings. Ithaca, N.Y., 1937. 30p. New York. College of agriculture at Cornell University. Extension bulletin no. 367.

Water Supply, Rural

Farm gets running water. By W.G. Kaiser. Southern Planter. v. 98, no. 3. March, 1937. p. 18. Complete septic tank easily built and thoroughly reliable, brings the farm that great convenience of city life - the comfort of running water. It also offers a better guarantee of continued health of the family.

Farm ponds pass critical tests. By R. W. Oberlin. Soil Conservation. v. 2, no. 9. March, 1937. p. 210-211.

We'll have running water. By E. T. Leavitt. Hoard's Dairyman. v. 82, no. 2. January 25, 1937. p. 52.

Will ponds solve the problem? Prairie Farmer. v. 109, no. 3. January 30, 1937. p. 4, 20.

Weirs.

Measurement of a head on a weir. By P.S.Wilson. Water Works & Sewerage. v. 84, no. 3. March, 1937. p. 105-106.

Wood.

Structure, occurrence, and properties of compression wood. M. Y. Pillow and R.F. Luxford. Washington, D.C., 1937. 32p. U.S. Department of Agriculture. Technical bulletin no. 546.